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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/971,763	10/09/2001	Moo-youl Kim	P56598	4212

7590 12/23/2002

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EXAMINER

BROOKE, MICHAEL S

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 12/23/2002

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/971,763

Applicant(s)

KIM ET AL.

Examiner

Michael S. Brooke

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20, 22, 24 and 26-28 is/are rejected.
- 7) ☒ Claim(s) 21, 23 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 November 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on 11/22/02. These drawings are not acceptable. The drawings showing Figs. 2 and 3 are acceptable. However, the drawing showing Fig. 4 is not acceptable, as it introduces new matter into the specification.

Response to Amendment

2. The amendment filed 11/22/02 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

Applicant has added a paragraph to the specification describing new Fig. 4. This paragraph states that electrodes 141' are on the underside of the nozzle plate. This is new matter, as the original specification does not teach an electrode being formed on the underside of the nozzle plate.

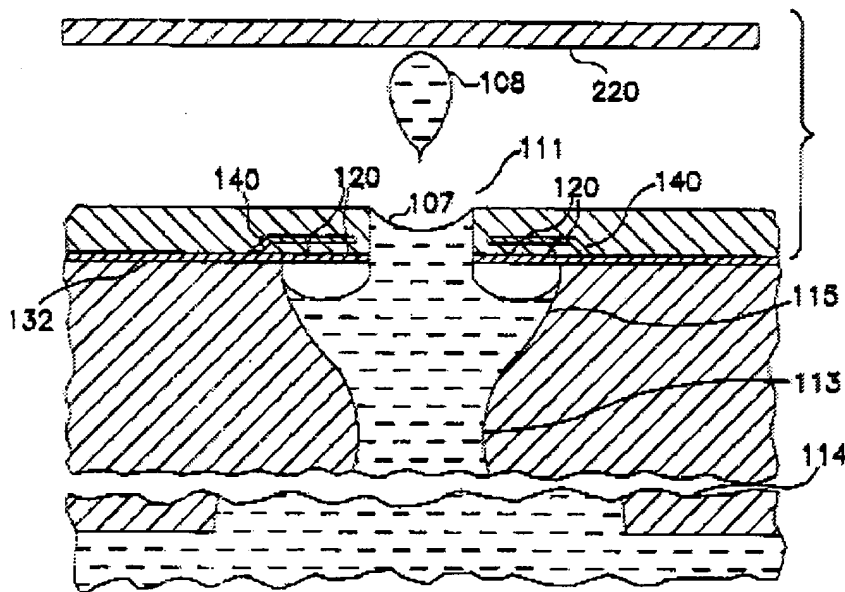
Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4-9, 11-16, 18-20, 22, 24, 26, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (5,841,452) in view of Saikawa (JP 04250046 abstract).



Silverbrook teaches (Fig. 17, above) an ink jet print head comprising a base plate (130), which is perforated by an hour-glass shaped structure having a hemispherical shaped top portion that is filled with ink, a nozzle plate that is mounted on the base plate and is perforated by a plurality of orifices in communication with their respective

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chambers, a plurality of dough-nut shaped heaters (120) disposed on the underside of the nozzle plate and surrounding each nozzle and a plurality of ink inlet passages (113), which supply ink from a reservoir to the hemispherical hour-glass shaped chamber. As can be seen Fig. 18 (which is a reverse structure of Fig. 17), each hemispherical chamber is connected to a funnel shaped chamber (489). Since Fig. 18 is a reverse of Fig. 17, these funnel shaped chambers would be found beneath the hemispherical chambers of Fig. 17.

Silverbrook teaches the claimed invention with the exception of the ink inlet passages each having a plurality of grooves formed at an inner wall, the plurality of grooves extending through the base plate, the plurality of grooves being formed over an entire portion of said inner wall and the plurality of grooves extending in a direction parallel to a direction through said substrate.

Saikawa teaches an ink jet print head having a plurality of ink passages (21), each of which has a plurality of grooves formed in a direction parallel to the direction of ink flow. The grooves ensure that the flow of ink is maintained from an ink supply to a common ink chamber, even if bubbles are present in the ink passages.

It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made to have provided Silverbrook with an ink inlet passage having a plurality of grooves formed in its walls, such that the grooves cover an entire portion of the wall, in a direction parallel to the ink flow direction (which is through the substrate), for the purpose of ensuring that the flow of ink is maintained from an ink supply to a

common ink chamber, even if bubbles are present in the ink passages, as taught by Saikawa.

1. Claims 3, 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (5,841,452) in view of Saikawa (JP 04250046 abstract), as applied to claims 1, 2, 4-9, 11-16, 18-20, 22, 24, 26, 27 and 28 above, and further in view of Chwalek et al. (6,022,099).

Silverbrook, as modified, teaches the claimed invention with the exception of each of the heaters being installed on the outer side of the nozzle plate.

Chwalek et al. teaches (Fig. 1b) an ink jet printing apparatus, wherein an annular heater (50) is provided around an orifice (46), on the outer side of a nozzle plate (56). The heater functions to both reduce the surface of the ink, thereby causing the meniscus to expand, and to boil the ink, thereby causing droplet ejection (col. 3:7-20). A heater having this arrangement provides the advantages of significant improvements in drop size and placement accuracy, increased printing speed and print head durability (col. 2:45-67 and col. 3:1-4).

It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made to have provided the heater of Silverbrook on the outer side of the nozzle plate, as taught by Chwalek et al., in order to provide significant improvements in drop size and placement accuracy, increased printing speed and print head durability.

Allowable Subject Matter

5. Claims 21, 23 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: Claims 21, 23 and 25 recite that the grooves are formed over the entire inner wall of the ink inlet passages. This feature is not taught in the prior art of record.

Response to Arguments

7. Applicant's arguments filed 11/22/02 have been fully considered but they are not persuasive.

Applicant's argument that Fig. 1 is not taken from a patent or publication and is the work product of the Applicant is not well taken. The Examiner directs the Applicant's attention to Fig. 9 of Keefe et al., which shows a figure identical, save for the numbering, to Applicant's Fig. 1. The present invention does not appear to be assigned to Hewlett-Packard, therefore the Examiner does not see how the figure is the work product of the Applicant. The Applicant is invited to provide an explanation. Without an explanation to the contrary, Applicant's Fig. 1, appears to have been taken from Keefe et al. (or one of the other patents assigned to HP) and therefore, is not the work product of the inventor. Accordingly, Applicant's Fig. 1 is considered to be prior art.

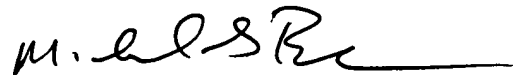
Applicant's arguments with regards to Mori and Cielo et al. are deemed to be moot in view of the new grounds of rejection.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael S. Brooke whose telephone number is 703-305-0262. The examiner can normally be reached on M-F 5:30-2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3431 for regular communications and 703-305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.



Michael S. Brooke
Examiner
Art Unit 2853

MSB
December 17, 2002